

ABSTRACT

A1  
A method for forming a silicon film, comprising, applying by patterning an ink composition containing a silicon compound onto a substrate by an ink jet process for stably forming a desired silicon film pattern with low energy consumption at a low cost, and a method for forming a silicon film without a convention vacuum process, photolithography and etching, in the production of a device having a desired silicon film pattern onto a substrate having a large area. It is another object to provide a composition containing a silicon precursor and a method for patterning a silicon film, in the production of a device having a silicon film doped with boron or phosphorus in which a film comprising a modified silicon compound as a silicon precursor is formed using a solution, and the silicon precursor film is converted into a semiconductive silicon and doping is simultaneously achieved by heat and/or light treatment in an inert atmosphere.

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An ink composition 1 containing a silicon precursor is selectively discharged into predetermined regions on a substrate from an ink jet head 2 to form a pattern of the silicon precursor, and is subjected to a heat and/or light treatment to convert the silicon precursor into an amorphous silicon film 5 or a polycrystalline silicon film 6. A silicon film pattern is thereby obtained on a large area at low cost with low energy.

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